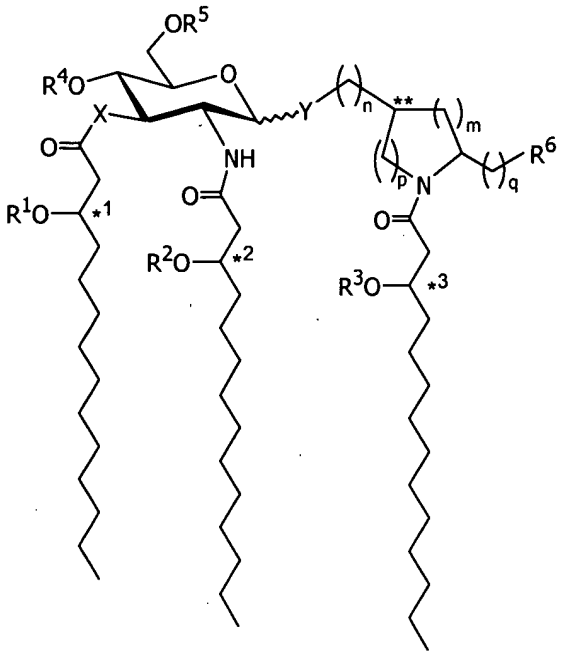
CLAIMS

What is claimed is:

1. A method for ameliorating or substantially preventing an infectious disease, autoimmune disease or allergic condition in a subject comprising contacting the subject with an effective amount of one or more compounds having the formula:



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and pharmaceutically acceptable salts there of, wherein X is a member selected from the group consisting of –O- and –NH-;

Y is a member selected from the group consisting of –O- and –S-;

R^1, R^2 and R^3 are each members independently selected from the group consisting of (C_2-C_{20})acyl;

R^4 is a member selected from the group consisting of -H and $-PO_3R^7R^8$, wherein R^7 and R^8 are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^5 is a member selected from the group consisting of –H, $-CH_3$ and $-PO_3R^9R^{10}$, wherein R^9 and R^{10} are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^6 is selected from H, OH, (C_1-C_4)oxyaliphatic groups, $-PO_3R^{11}R^{12}$, $-OPO_3R^{11}R^{12}$, $-SO_3R^{11}$, $-OSO_3R^{11}$, $-NR^{11}R^{12}$, $-SR^{11}$, -CN, $-NO_2$, -CHO, $-CO_2R^{11}$, and $-CONR^{11}R^{12}$, wherein R^{11} and R^{12} are each independently selected from H and (C_1-C_4)aliphatic groups, with the provisos that one of R^4 and R^5 is a phosphorus-containing group and that when R^4 is $-PO_3R^7R^8$, R^5 is other than $-PO_3R^9R^{10}$;

wherein "$*^1$", "$*^2$", "$*^3$" and "**" represent chiral centers;

wherein *n, m, p* and *q* are each independently an integer from 0 to 6, with the proviso that the sum of *p* and *m* is from 0 to 6.

2. The method of claim 1, wherein X and Y are –O-, R^4 is $PO_3R^7R^8$, R^5 and R^6 are H, and *n, m, p*, and *q* are integers from 0 to 3.

3. The method of claim 2, wherein R^7 and R^8 are –H.

4. The method of claim 2, wherein *n, m, p*, and *q* are from 0 to 2.

5. The method of claim 2, wherein *n* is 1, *m* is 2, and *p* and *q* are 0.

6. The method of claim 1 wherein R_1, R_2 and R_3 are each C_6-C_{14} acyl.

7. The method of claim 1 wherein R_1, R_2; and R_3 are each C_6-C_{12} acyl.

8. The method of claim 5 wherein R_1, R_2, and R_3 are each decanoyl residues.

9. The method of claim 5 wherein R_1, R_2, and R_3 are each dodecanoyl residues.

10. The method of claim 5, wherein R_1, R_2, and R_3 are each tetradecanoyl residues.

11. The method of claim 5, wherein $*^1$, $*^2$, and $*^3$ are in the *R* configuration.

12. The method of claim 5, wherein Y is in the equatorial position.

13. The method of claim 5, wherein ** is in the *S* configuration.

14. The method of claim 5, wherein $*^1$, $*^2$, and $*^3$ are in the *R* configuration, wherein Y is in the equatorial position, and wherein ** is in the *S* configuration.

15. The method of claim 1, wherein the infectious disease is caused by a bacteria, a virus, a parasite, or a fungus.

16. The method of claim 15, wherein said bacteria is a gram negative bacteria, or a gram positive bacteria.

17. The method of claim 15, wherein the infectious disease is caused by a bacteria selected from the group consisting of *Pseudomonas, Escherichia, Klebsiella, Enterobacter, Proteus, Serratia, Candida, Bacillus,* and *Staphylococcus*.

18. The method of claim 17, wherein the infectious disease is pneumonia.

19. The method of claim 18, wherein said pneumonia is nosocomial pneumonia.

20. The method of claim 19, wherein said pneumonia is in an HIV-positive patient.

21. The method of claim 1, wherein said infectious disease is a chronic infection.

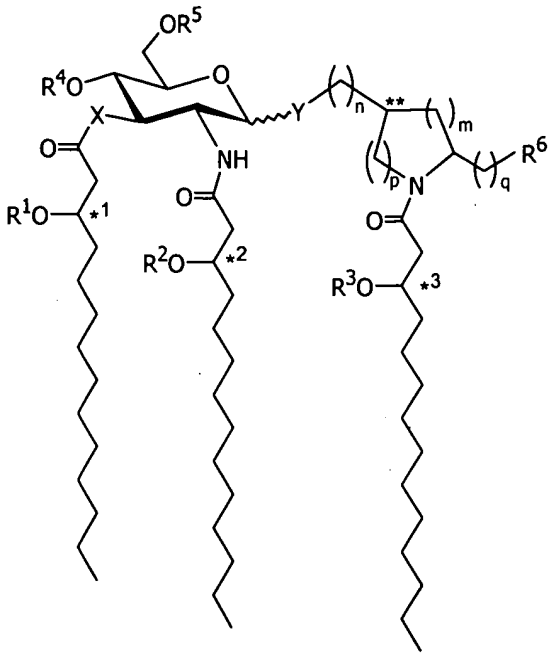
22. The method of claim 21, wherein said chronic infection comprises chronic hepatitis, human papillomavirus, oral or vaginal candidiasis, periodontal disease or chronic rhinosinusitis due to fungal colonization.

23. The method of claim 1, wherein said allergic condition is selected from the group consisting of asthma, atopic dermatitis, seasonal allergic disorder and chronic rhinosinusitis.

24. The method of claim 1, wherein said autoimmune disease is selected from the group consisting of inflammatory bowel disease, rheumatoid arthritis, chronic arthritis, multiple sclerosis and psoriasis.

25. The method of claim ~~1, wh~~erein said compound is administered to said animal by a route selected from the group consisting of parenteral, oral, intravenous, infusion, intranasal, inhalation, transdermal and transmucosal.

26. A method for prophylactic treatment of a bacterial or viral infection in a subject comprising contacting the subject with an effective amount of one or more compounds having the formula:



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and a pharmaceutically acceptable salts there of, wherein X is a member selected from the group consisting of –O- and –NH-;

Y is a member selected from the group consisting of –O- and –S-;

R^1, R^2 and R^3 are each members independently selected from the group consisting of (C_2-C_{20})acyl;

R^4 is a member selected from the group consisting of -H and $-PO_3R^7R^8$, wherein R^7 and R^8 are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^5 is a member selected from the group consisting of –H, $-CH_3$ and $-PO_3R^9R^{10}$, wherein R^9 and R^{10} are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^6 is selected from H, OH, (C_1-C_4)oxyaliphatic groups, $-PO_3R^{11}R^{12}$, $-OPO_3R^{11}R^{12}$, $-SO_3R^{11}$, $-OSO_3R^{11}$, $-NR^{11}R^{12}$, $-SR^{11}$, -CN, $-NO_2$, -CHO, $-CO_2R^{11}$, and $-CONR^{11}R^{12}$, wherein R^{11} and R^{12} are each independently selected from H and (C_1-C_4)aliphatic groups, with the provisos that one of R^4 and R^5 is a phosphorus-containing group and that when R^4 is $-PO_3R^7R^8$, R^5 is other than $-PO_3R^9R^{10}$;

wherein "*1", "*2" , "*3" and "**" represent chiral centers;

wherein *n, m, p* and *q* are each independently an integer from 0 to 6, with the proviso that the sum of *p* and *m* is from 0 to 6.

27. The method of claim 26, wherein X and Y are –O-, R^4 is $PO_3R^7R^8$, R^5 and R^6 are H, and *n, m, p*, and *q* are integers from 0 to 3.

28. The method of claim 27, wherein R^7 and R^8 are –H.

29. The method of claim 27, wherein *n, m, p*, and *q* are from 0 to 2.

30. The method of claim 28, wherein *n* is 1, *m* is 2, and *p* and *q* are 0.

31. The method of claim 26, wherein R_1, R_2 and R_3 are each C_6-C_{14} acyl.

32. The method of claim 26, wherein R_1, R_2; and R_3 are each C_6-C_{12} acyl.

33. The method of claim 30, wherein R_1, R_2, and R_3 are each decanoyl residues.

34. The method of claim 30, wherein R_1, R_2, and R_3 are each dodecanoyl residues.

35. The method of claim 30, wherein R_1, R_2, and R_3 are each tetradecanoyl residues.

36. The method of claim 30, wherein *1, *2 , and *3 are in the *R* configuration.

37. The method of claim 30, wherein Y is in the equatorial position.

38. The method of claim 30, wherein ** is in the *S* configuration.

39. The method of claim 30, wherein $*^1$, $*^2$, and $*^3$ are in the *R* configuration, wherein Y is in the equatorial position, and wherein ** is in the *S* configuration.

40. The method of claim 26, wherein the infectious disease is caused by a bacteria, a virus, a parasite, or a fungus.

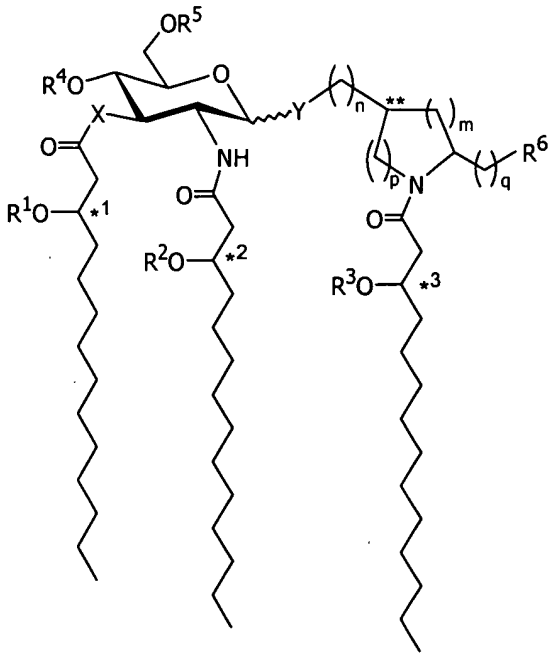
41. The method of claim 40, wherein said bacteria is a gram negative bacteria, or a gram positive bacteria.

42. The method of claim 40, wherein the infectious disease is caused by a bacteria selected from the group consisting of *Pseudomonas, Escherichia, Klebsiella, Enterobacter, Proteus, Serratia, Candida, Bacillus,* and *Staphylococcus.*

43. The method of claim 42, wherein the infectious disease is pneumonia.

44. The method of claim 43, wherein said pneumonia is nosocomial pneumonia.

45. A composition formulated and administered in the absence of exogenous antigen comprising one or more compounds having the formula:



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and pharmaceutically acceptable salts thereof, wherein X is a member selected from the group consisting of –O- and –NH-;

Y is a member selected from the group consisting of –O- and –S-;

R^1, R^2 and R^3 are each members independently selected from the group consisting of (C_2-C_{20})acyl;

R^4 is a member selected from the group consisting of -H and $-PO_3R^7R^8$, wherein R^7 and R^8 are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^5 is a member selected from the group consisting of –H, $-CH_3$ and $-PO_3R^9R^{10}$, wherein R^9 and R^{10} are each members independently selected from the group consisting of –H and (C_1-C_4)aliphatic groups;

R^6 is selected from H, OH, (C_1-C_4)oxyaliphatic groups, $-PO_3R^{11}R^{12}$, $-OPO_3R^{11}R^{12}$, $-SO_3R^{11}$, $-OSO_3R^{11}$, $-NR^{11}R^{12}$, $-SR^{11}$, -CN, $-NO_2$, -CHO, $-CO_2R^{11}$, and $-CONR^{11}R^{12}$, wherein R^{11} and R^{12} are each independently selected from H and (C_1-C_4)aliphatic groups, with the provisos that one of R^4 and R^5 is a phosphorus-containing group and that when R^4 is $-PO_3R^7R^8$, R^5 is other than $-PO_3R^9R^{10}$;

wherein "*1", "*2" , "*3" and "**" represent chiral centers;

wherein *n, m, p* and *q* are each independently an integer from 0 to 6, with the proviso that the sum of *p* and *m* is from 0 to 6; in combination with a pharmaceutically acceptable carrier.

46. The pharmaceutical composition of claim 45, wherein X and Y are –O-, R^4 is $PO_3R^7R^8$, R^5 and R^6 are H, and *n, m, p,* and *q* are integers from 0 to 3.

47. The pharmaceutical composition of claim 46, wherein R^7 and R^8 are –H.

48. The pharmaceutical composition of claim 46, *n, m, p*, and *q* are from 0 to 2.

49. The pharmaceutical composition of claim 47, wherein *n* is 1, *m* is 2, and *p* and *q* are 0.

50. The pharmaceutical composition of claim 45, wherein R_1, R_2 and R_3 are each C_6-C_{14} acyl.

51. The pharmaceutical composition of claim 45, wherein R_1, R_2; and R_3 are each C_6-C_{12} acyl.

52. The pharmaceutical composition of claim 49, wherein R_1, R_2, and R_3 are each decanoyl residues.

53. The pharmaceutical composition of claim 49, wherein R_1, R_2, and R_3 are each dodecanoyl residues.

54. The pharmaceutical composition of claim 49, wherein R_1, R_2, and R_3 are each tetradecanoyl residues.

55. The pharmaceutical composition of claim 49, wherein $*^1$, $*^2$, and $*^3$ are in the *R* configuration.

56. The pharmaceutical composition of claim 49, wherein Y is in the equatorial position.

57. The pharmaceutical composition of claim 49, wherein ** is in the *S* configuration.

58. The pharmaceutical composition of claim 49, wherein $*^1$, $*^2$, and $*^3$ are in the *R* configuration, wherein Y is in the equatorial position, and wherein ** is in the *S* configuration.

59. A pharmaceutical composition of claim 45, further comprising one or more surfactants.

60. A pharmaceutical composition of claim 59, wherein said one or more surfactants is selected from the group consisting of dimyristoyl phosphatidyl glycerol (DPMG), dipalmitoyl phosphatidyl glycerol (DPPG), distearoyl phosphatidyl glycerol (DSPG), dimyristoyl phosphatidylcholine (DPMC), dipalmitoyl phosphatidylcholine (DPPC), distearoyl phosphatidylcholine (DSPC); dimyristoyl phosphatidic acid (DPMA), dipalmitoyl phosphatidic acid (DPPA), distearoyl phosphatidic acid (DSPA); dimyristoyl phosphatidyl ethanolamine (DPME), dipalmitoyl phosphatidyl ethanolamine (DPPE) and distearoyl phosphatidyl ethanolamine (DSPE).

R126 61. 62. A method for ameliorating or substantially preventing an infectious disease, autoimmune disease or allergic condition in a subject comprising contacting the subject with an effective amount of a cyclic AGP.

63. The method of claim 61 wherein said cyclic AGP is *N*-[(*R*)-3-dodecanoyloxytetradecanoyl]-(*S*)-2-pyrrolidinylmethyl 2-deoxy-4-*O*-phosphono-2-[(*R*)-3-dodecanoyloxy-tetradecanoylamino]-3-*O*-[(*R*)-3-dodecanoyloxytetradecanoyl]- β-D-glucopyranoside or a pharmaceuticaly acceptable salt thereof.

64. The method of claim 61 wherein said cyclic AGP is *N*-[(*R*)-3-decanoyloxytetradecanoyl]-(*S*)-2-pyrrolidinylmethyl 2-deoxy-4-*O*-phosphono-2-[(*R*)-3-decanoyloxytetradecanoylamino]-3-*O*-[(*R*)-3-decanoyloxytetradecanoyl]- β-D-glucopyranoside or a pharmaceutically acceptable salt thereof.